

REMARKS

In response to the indication that claims 4 and 5 are allowable, they have been rewritten in independent form. When incorporating the terms of independent claim 2 into rewritten claims 4 and 5, the sixth word from the end of the claim has been changed for clarity. The formal allowance of claims 4 and 5 is therefore solicited.

Claim Rejections Under 35 U.S.C. §102

Claims 1-3 have been rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 7,034,874 to Reinhart et al. ("Reinhart").

One aspect of the present invention allows a determination to be made in a short amount of time as to whether a given photo-sensor element (pixel) is good or not. Since this process may be performed as part of acquiring data of an actual image, a reduction in the amount of time required to check the large number of pixels of the photo-sensor will shorten the image data acquisition time. The time is shortened by first checking the signs of differences calculated between the outputs of a given pixel and neighboring pixels, and then comparing those differences with a threshold for only those relatively few elements where the signs of the differences are the same. Since, typically, nearly all the photo-sensor pixels are good, the time consuming step of comparing the differences with a threshold is performed only for the few bad pixels. For the majority of good pixels, the computation involves only calculating the pixel value differences and then determining the relative signs of these differences.

Independent claims 1 and 2 have been amended to more particularly point out the subject matter of the invention. After difference values are calculated, the signs of these differences are compared. Only when the differences have the same signs is the step of comparing the difference values with a threshold carried out. Only then is there a possibility that the pixel is defective. A good pixel is identified as such by comparing signs of the differences between pixels, without the need for the time consuming comparison of the magnitudes of the differences with a threshold.

The cited Reinhart patent, on the other hand, describes a process where, before a pixel is found to be good, both the signs of the pixel magnitude differences and the comparison of their magnitudes with a threshold are performed. Indeed, both appear to be done for each pixel of the

array. There is certainly no suggestion by Reinhart of identifying the good pixels by comparing signs of the pixel magnitude differences without the need to compare the magnitudes of those differences with a threshold.

The Office Action primarily references column 4, lines 2-22 of Reinhart, in support of the anticipation rejection. But that portion of Reinhart particularly stresses comparing the differences of pixel magnitudes with a threshold, as well as looking at their signs, as part of a process of determining whether a particular pixel is an "outlier." This is a first step performed for all of the pixels. The process then continues, as described by Reinhart at column 4, lines 23-32, to determine whether an "outlier" is a "bad" pixel. There is no suggestion by Reinhart that a determination that a pixel is good may be made by comparing signs of the differences alone. Claims 1 and 2, as amended, are therefore submitted to be novel and patentable over Reinhart.

Dependent claim 3 is submitted to be patentable for the same reason as its parent claim 2. In addition, the use of separate thresholds with positive and negative pixel differences is not found to be disclosed by Reinhart. The Office Action (p. 4, lns. 1-4) references column 4, lines 18-22 of Reinhart as disclosing the use of such separate thresholds but that passage is respectfully submitted not to relate to this feature.

Therefore, it is respectfully submitted that rejected claims 1-3 are novel over the cited Reinhart reference and patentable.

New Claims

Claim 6 is dependent upon claim 2 and, therefore, submitted to be allowable for the reasons set forth above for claim 2. In addition, the use of different thresholds for positive and negative pixel magnitude differences is specified. This is similar to dependent claim 3 but expressed differently. Nothing in Reinhart is found to suggest this added feature.

New independent claim 7 is patterned after claim 1 but expressed differently. Claim 7 specifies that the given element is identified to be of high quality by comparing signs of the pixel magnitude differences without comparing these differences with a threshold, and is therefore submitted to be patentable. Dependent claims 8 and 9 recite a more detailed implementation of this.

New independent claim 10 is patterned after claim 2 but expressed differently. A pixel is determined not to be defective, and its output utilized, by reference only to the signs of the pixel magnitude differences. Claim 10 is therefore submitted to be patentable.

New independent claim 11 is generally directed to the same subject matter as claims 1 and 2. Claim 11 specifies that only when the difference values for a given pixel (element) have the same sign, are those values compared with a threshold in order to determine whether the output of the pixel is to be used. Claim 11 is submitted to be patentable for this reason. Dependent claims 12 and 13 are believed to be patentable for the same reason as claim 11, plus because of the recitation of two different thresholds being used. An example, as recited in claim 13, is the use of separate thresholds for positive and negative difference values of the signal. Dependent claims 14 and 15 are directed generally to the same subject matter as allowable claims 4 and 5, respectively.

New independent claim 16 is presented as an apparatus claim. The electronic processing decides to provide data of a corresponding image pixel from the output of a sensor element without performing any further processing when the difference values have the different signs. For this reason, claim 16 is submitted to be patentable.

Application Papers - Drawings

On page 1 of the Office Action, the status of the drawings is not indicated. It should be noted that formal drawings were filed on February 2, 2004, which are available in PAIR, to replace the informal drawings filed with the application on July 7, 2003. It is respectfully requested that the formal drawings filed February 2, 2004 be used in any further publication or grant of the present application.

Conclusion

It is believed that this application is now in condition for allowance and an early indication of its allowance is solicited. However, if the Examiner has any further matters that need to be resolved, a telephone call to the undersigned at 415-318-1163 would be appreciated.

FILED VIA EFS

Respectfully submitted,



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Date

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